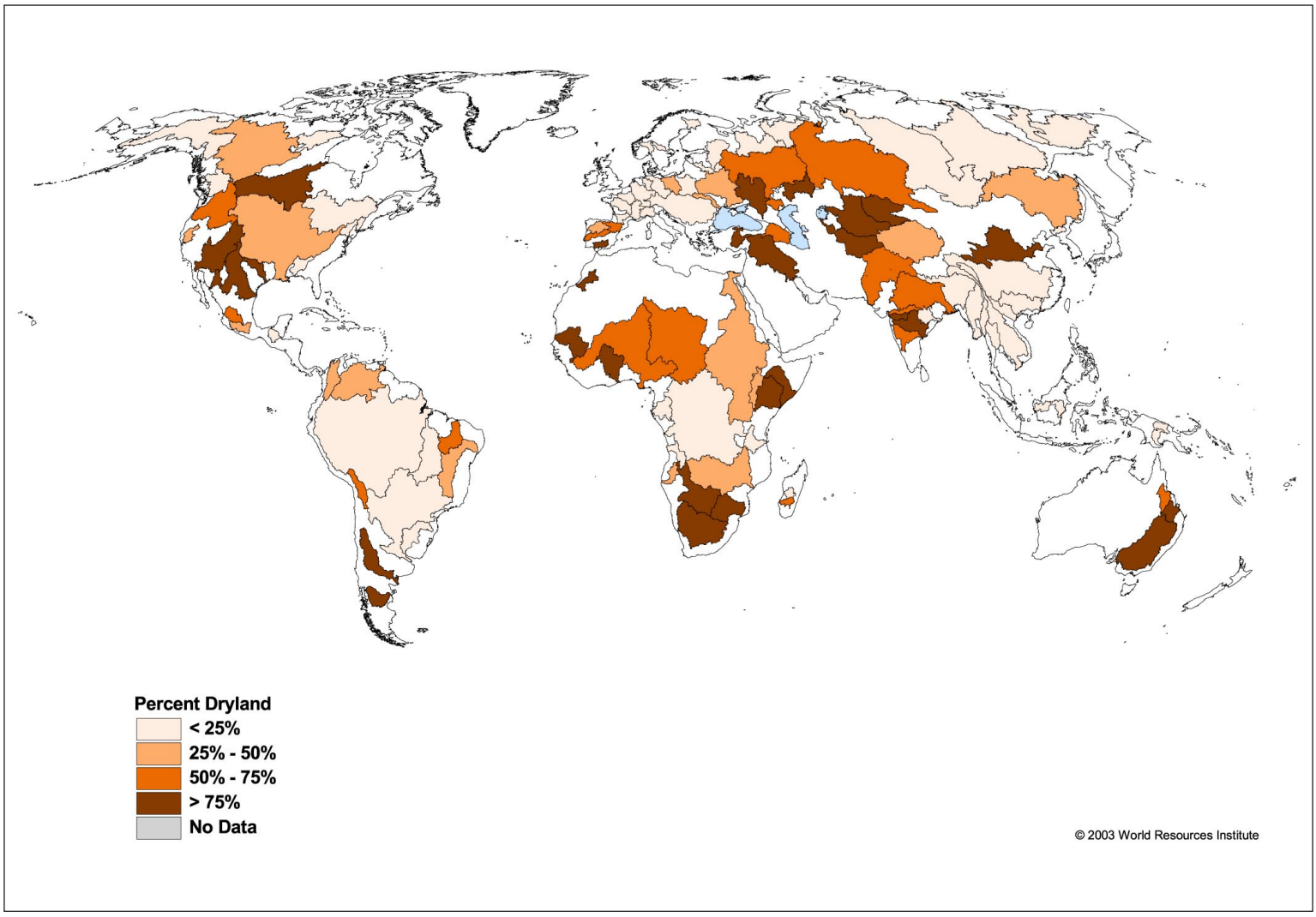
Watersheds of the World : Global Maps

10. Dryland Area by Basin



Map Description

The world's drylands encompass grasslands, agricultural lands, forests, and urban areas, making up approximately 40 percent of the total global land area. Commonly recognized drylands include the African Sahel, the Australian Outback, the South American Patagonia, and the North American Great Plains.

The United Nations Convention to Combat Desertification (UNCCD) identifies drylands by determining the extent and distribution of aridity zones. Six aridity zones are delineated based on the ratio of precipitation to potential evapotranspiration (PET). PET is the amount of moisture that, if it were available, would be removed from a given land area by evaporation and transpiration (UNEP 1997). Drylands, as defined by the UNCCD, encompass the arid, semi-arid, and dry sub-humid zones (excluding polar and sub-polar regions). In these zones, ratios of mean annual precipitation to mean annual PET range from 0.05 to 0.65. Additional aridity zones include hyperarid environments where ratios are less than 0.05 and humid areas where ratios are greater then 0.65.

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Dryland ecosystems, although providing a wide array of goods and services, are not always recognized as fully as other terrestrial ecosystems on the planet. Drylands support flora, fauna, and people in important and often unique ways. Nearly 2 billion people live in drylands. In rural areas, many of these people rely on herding livestock and farming. Many urban areas with high population densities also exist in drylands. Examples are cities such as Cape Town, Mexico City, and Teheran.

Drylands produce forage for domestic livestock and are used extensively for food production. Freshwater resources in drylands, often limited and variable in availability, are important water sources for drinking, irrigating crops, and supporting wetland flora and fauna. Drylands provide habitat for species uniquely adapted to variable and extreme environments. Dryland species range from microorganisms, ants, grasshoppers, and snakes to large carnivores such as cheetahs and leopards. Drylands, because of their extensive area, can store large amounts of carbon, most of it in the soil rather than in vegetation. Improving the carbon storage capacity of drylands may be one method to help offset global warming by lowering CO2 concentrations in the atmosphere. Drylands supply a critical source of wood fuel for cooking and are potentially important locations for wind and solar power. As tourisms destinations, they support recreational activities such as hunting, wildlife-watching, and photography.

This map shows the percentage of the basin area that is classified as dryland according to the UNCCD definition– made up of arid, semi-arid, or dry subhumid aridity zones. Predominantly dryland basins, or those with more than 75 percent of their area classified as dryland, are found in every continent; however the majority of these basins are found in Africa and Central Asia, and in the Middle East. The top five basins with the greatest percentage of their area classified as dryland include the Ural basin in Russia and Kazakhstan, the Guadalquivir in Spain, the Yaqui in Mexico and the United States, the Tapti in India, and the Tigris & Euphrates in Iran, Syria and Turkey.

Examination of drylands according to watershed boundaries can assist in the assessment of water resources in areas of great need. The relative lack of freshwater resources within drylands makes existing sources of surface water, groundwater, and wetland habitats critically important. Assessment of the availability and variability of water within watersheds in drylands can lead to more accurate and realistic management plans responding to the demand for water for household purposes as well as for industry, agriculture, recreation, and wildlife.

Mapping Details

The identification of the dryland area is based on UNEP's global aridity zone map from the World Atlas of Desertification (1997). This global dataset is a 30-minute resolution map that divides the world into six aridity zones. This map is based on an aridity index derived from the ratio of mean annual precipitation to the mean annual potential evapotranspiration. The amount of dryland area in each basin was calculated with an intersection function using geographic information system software.

Map Projection

Robinson

Sources

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